

Claims

1. A fuel cell assembly having a plurality of fuel cell component elements extending under compressive pressure between a pair of endplates to form a cell stack assembly, and having a reactant gas manifold, said elements having mutually uneven surfaces at ends thereof to which said manifold is to be sealed, and having a first seal part comprising at least one type of elastomer applied to said mutually uneven surfaces;
5 characterized by the improvement comprising:
a groove disposed within a contact surface of said manifold
10 for receiving an elastomer gasket;
a notch extending from a surface of each of said endplates for receiving an end portion of a rigid strip coplanar with said endplate surface to form a sealing surface of said stack assembly coextensive with and facing said manifold contact surface;
15 a second seal part comprising an elastomer gasket disposed within said groove of said manifold; and
a third seal part comprising a rigid dielectric strip interposed between said first seal part and said second seal part.
2. An assembly according to claim 1 wherein said rigid strip is an angled corner strip.
3. An assembly according to claim 1 wherein said rigid strip is flat.
4. An assembly according to claim 1 wherein said rigid strip comprises a fiberglass reinforced plastic.

5. An assembly according to claim 1 wherein said rigid strip comprises a polymer-coated metal.

6. A fuel cell assembly including a cell stack assembly and a reactant gas manifold having a contact surface with a groove disposed therein for receiving an elastomer gasket, said cell stack assembly having a rigid sealing surface coextensive with and facing said manifold contact surface, said manifold contact surface being in direct contact with said rigid sealing surface of said stack assembly when said manifold is sealed to said stack assembly by an applied sealing force.

7. A manifold seal system for sealing a fuel cell manifold to a fuel cell stack assembly, said manifold having a contact surface facing a corresponding sealing surface of said fuel cell stack assembly, said system including a rigid dielectric strip at the interface between said manifold contact surface and said corresponding fuel cell stack assembly sealing surface.

8. A manifold seal system according to claim 7 wherein said rigid dielectric strip is angled.

9. A manifold seal system according to claim 7 wherein said rigid dielectric strip is flat.

10. A method of sealing a contact surface of a reactant gas manifold to endplates and fuel cell component elements of a fuel cell stack assembly comprising:

- (a) forming a groove in the contact surface of said manifold;
- (b) providing an elastomer gasket disposed within said groove;
- (c) providing a notch in a surface of said end plate for receiving a rigid dielectric strip coplanar with said endplate surfaces to form a sealing surface of said stack assembly;
- (d) applying at least one layer of an elastomer to the regions of said fuel cell elements that are to be sealed to said manifold to provide a surface which is relatively smooth and flat;
- (e) adhering a rigid dielectric strip to said elastomer layer; and
- (f) installing said manifold on said fuel cell stack assembly such that its entire contact surface is in direct contact with said sealing surface of said stack assembly, said rigid strip being between said manifold and said silicone rubber layer.